



HAL
open science

Reactive Bubbly Flows

Michael Schlüter, Anne-Marie Billet, Sonja Herres-Pawlis

► **To cite this version:**

Michael Schlüter, Anne-Marie Billet, Sonja Herres-Pawlis. Reactive Bubbly Flows. Chemical Engineering and Technology, 2017, 40 (8), pp.1384-1384. 10.1002/ceat.201770085 . hal-04023172

HAL Id: hal-04023172

<https://hal.science/hal-04023172>

Submitted on 21 Apr 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Editorial

Reactive Bubbly Flows

Our modern society constantly needs goods with high quality, purity and low environmental impact. Owing to depleting natural resources and growing global population, we are obliged to the principles of sustainability which force us to develop more efficient processes to enable a conversion from raw materials to final products with a minimum of byproducts. This concerns for example oil processing as well as pharmaceutical industry or food engineering. To design such processes, a deep understanding of the reaction network with the kinetic timescales for products and byproducts is necessary as well as the knowledge about the timescales of mixing to bring the reactants into contact. This gets more complicated if a reactive gas like oxygen, hydrogen, or chlorine has to be transferred into the liquid phase across a fluidic interface like in many applications in chemical and biochemical engineering. The understanding of the interaction between mass transfer, mixing, and chemical reaction needs a strong collaboration between chemists, physicists, engineers, and mathematicians to measure and model the complex phenomena in these reactive bubbly flows. To strengthen the research in this emerging field of science, in 2014 the German research foundation has established the priority program 1740 "Reactive Bubbly Flows", which has now finished the first funding period with remarkable results and interesting achievements.

Motivated by discussions on international conferences, one of the leading French institutions in this field of research, the Fédération de Recherche FERMaT ("Fluids, Energy, Reactors, Materials and Transfer") at the University of Toulouse, invited the priority program for a Symposium on Non-Invasive Measuring Tools and Numerical Methods for the Investigation of Non-Reactive and Reactive Gas-Liquid Flows. This symposium has been so successful and inspiring, that the organizers decided to publish the most interesting results within this special issue of *Chemical Engineering & Technology*.

We hope that many readers get fascinated by the tremendous potential of designing reactive bubbly flows like we did during our symposium.

This special issue of *Chemical Engineering & Technology* is dedicated to present 17 selected contributions from the Symposium on Non-Invasive Measuring Tools and Numerical Methods for the Investigation of Non-Reactive and Reactive Gas-Liquid Flows, held from June 6th until June 8th 2016 in Toulouse, France. A great variety of different topics are discussed, including new reaction networks for studying reactive bubbly flows, new measurement techniques for local velocity and concentration measurements as well as new numerical methods for the calculation of gas-liquid reactions.

We would like to express our gratitude to the colleagues and friends who contributed to this special issue.

Please enjoy it!

Prof. Michael Schlüter, Institute of Multiphase Flows, Hamburg University of Technology, Germany

Prof. Anne-Marie Billet, Laboratoire de Génie Chimique, Université de Toulouse, France

Prof. Sonja Herres-Pawlis, Institut für Anorganische Chemie, RWTH Aachen University, Germany



Michael Schlüter



Anne-Marie Billet



Sonja Herres-Pawlis